

CLAIM(S)

What is claimed is :

- 5 1. A PANI-PAAMPSA film comprising polyaniline in the emeraldine salt form (PANI) with poly(2-acrylamido-2 methyl-1-propanesulfonic acid) (PAAMPSA) as a counterion.
- 10 2. The film of Claim 1, having an electrical resistivity greater than 10^2 ohm-cm.
- 15 3. The film of Claim 1, further comprising at least one water-soluble host polymer.
- 20 4. The film of Claim 3, wherein the water-soluble host polymer is polyacrylamide (PAM), PAAMPSA, poly(acrylic acid) (PAA), poly(styrenesulfonic acid), poly(vinyl pyrrolidone)(PVPd), acrylamide copolymers, cellulose derivatives, carboxyvinyl polymer, poly(ethylene glycols), poly(ethylene oxide) (PEO), poly(vinyl alcohol) (PVA), poly(vinyl methyl ether), polyamine, polyimines, polyvinylpyridines, polysaccharide, polyurethane dispersion, and combinations thereof.
- 25 5. A method of forming the film of Claim 1, comprising the steps of:
providing a substrate;
providing an aqueous dispersion/solution comprising PANI-PAAMPSA;
and
depositing the aqueous dispersion/solution onto the substrate to form the film.
- 30 6. The method of Claim 5, wherein the aqueous dispersion/solution further comprises at least one water-soluble host polymer.

503

520

15

25

443
C2 520

14. The light-emitting diode of Claim 13, wherein the film has an electrical resistivity greater than 10^2 ohm-cm.

5 15. The device of Claim 13, wherein the film further comprises at least one water-soluble host polymer.

16. The device of Claim 15, where in the at least one water-soluble host polymer is polyacrylamide (PAM), PAAMPSA, poly(acrylic acid) (PAA),
10 poly(styrenesulfonic acid), poly(vinyl pyrrolidone)(PVPd), acrylamide copolymers, cellulose derivatives, carboxyvinyl polymer, poly(ethylene glycols), poly(ethylene oxide) (PEO), poly(vinyl alcohol) (PVA), poly(vinyl methyl ether), polyamine, polyimines, polyvinylpyridines, polysaccharide, polyurethane dispersion, and combinations thereof.

15 17. The device of Claim 16, wherein the film has an electrical resistivity greater than 10^4 ohm-cm.

18 The device of Claim 16, wherein the film has an electrical resistivity of
20 greater than 10^5 ohm-cm.

19. The device of Claim 13, wherein the film is disposed between a light-emitting polymer and a high work function electrode.

25 20. The device of Claim 19, wherein:
the high work function electrode comprises polyaniline, PEDT, indium tin oxide, an oxide of a metal from Group IIA (Be, Mg, Ca, Sr, Ba, Ra), an oxide of other metals from Groups IIIA (B, Al, Ga, Tl) or an oxide of metals from Group IVA (C, Si, Ge, Sn, Pb); and
30 wherein the device further comprises a low work function electrode selected from alkaline earth metals, alloys of alkaline earth metals, and alkaline earth metal oxides.